PRODUCTION ENGINEERING LABORATORY — SECTION 6

Fishing and Other Accessories

Restoration, Function, and Field Reference

Restored tools — Production Engineering Laboratory, DUIET

Department of Petroleum Engineering
Dibrugarh University Institute of Engineering and Technology (DUIET)
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Prepared by
Saqlain Choudhury
Supervisor: Dr. Nayan Medhi, Associate Professor, DUIET

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1. Introduction

This document covers fishing tools and miscellaneous well-control accessories restored as part of the Production Engineering Laboratory development exercise. Fishing tools are used to recover lost or stuck equipment from the wellbore, while the gasket, ring, and test-plug items covered here support pressure-sealing and BOP testing operations.

2. Overshot and Accessories

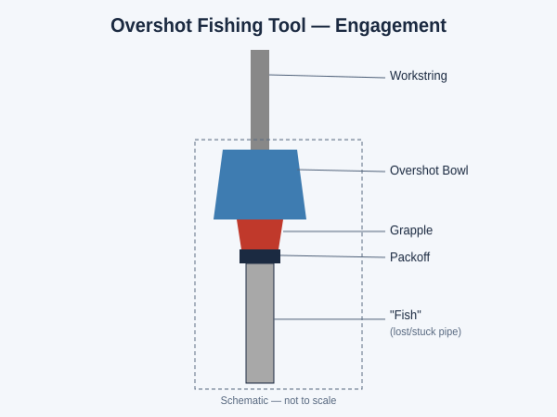
An overshot is a fishing tool run on the workstring to engage and retrieve a “fish” — industry terminology for lost or stuck equipment in the wellbore, such as a parted drill string, dropped tool, or stuck pipe section.

2.1 Working Principle

The overshot bowl is run down over the top of the fish. Internal accessories inside the bowl perform three functions: a guide centres the bowl over the fish as it is lowered; a grapple (spiral grapple or basket grapple) engages and grips the fish's outer surface once the overshot is correctly positioned; and a packoff, where fitted, seals around the fish to allow circulation while pulling, helping free fish that may be stuck by differential sticking or debris.

2.2 Restored Tool — Photograph & Schematic

Overshot and Accessories, restored — Production Engineering Laboratory, DUIET



Overshot engaging a fish (schematic)

2.3 Video & Reference — Scan to Access

Scan: Video

Scan: Reference

Video: Overshot fishing tool animation — search (YouTube)

Reference: Drilling Manual — Fishing tools and operations

3. Wireline / Slickline Gauge Cutters

Gauge cutters are run on slickline or wireline ahead of other downhole toolstrings.

3.1 Working Principle

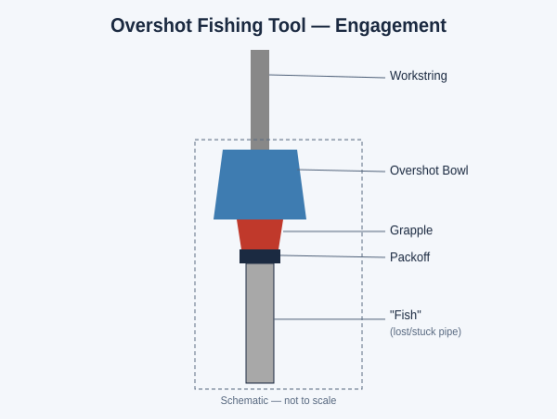
The gauge cutter has a fixed, precisely sized outer profile matching the minimum acceptable ID for the tubing or casing it will pass through. As it is lowered, it will tag and help clear minor obstructions — scale, paraffin, or debris — and will physically stop if it encounters a restriction smaller than its own gauge, providing a clear, unambiguous signal at surface that the path is not yet clean.

3.2 Why It Matters

Running a gauge cutter before sending in larger or more delicate tools (logging tools, plugs, gas lift valves) confirms a clean, known-diameter path, reducing the risk of an expensive tool becoming stuck partway into the well.

3.3 Restored Tool — Photograph & Schematic

Wireline / Slickline Gauge Cutters, restored



Gauge cutter run ahead of toolstring (concept)

3.4 Video & Reference — Scan to Access

Scan: Video

Scan: Reference

Video: Gauge cutter wireline/slickline — search (YouTube)

Reference: SLB (Schlumberger) — wireline operations reference

4. Gaskets, Pressure Ratings & BOP Gasket

Gaskets seal mating flanged connections — such as those on the BOP stack, wellhead spools, and surface piping — against internal pressure.

4.1 Working Principle

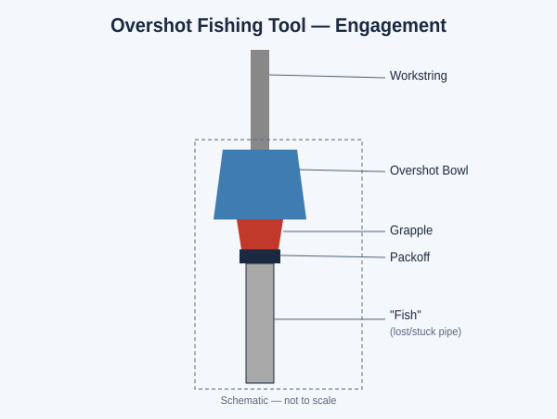
When two flanges are bolted together, the gasket is compressed between the flange faces, filling microscopic surface irregularities and creating a pressure-tight seal. Ring-type joint (RTJ) gaskets used in high-pressure oilfield service are typically solid metal rings seated in matching machined grooves, which deform slightly under bolt load to achieve a metal-to-metal seal capable of holding very high pressures.

4.2 Pressure Ratings

Each gasket type and connection is rated for a specific pressure class (e.g., API 6A / ASME pressure classes) and a matching connection profile. Using a gasket rated below the system's working pressure, or mismatched to the flange's groove profile, is a direct well-control and safety hazard — correct rating and fit-up are non-negotiable in BOP and wellhead service.

4.3 Restored Tools — Photograph & Schematic

Gaskets and rings used in BOP and flanged connections, restored



Sealing concept at flanged connection

4.4 Video & Reference — Scan to Access

Scan: Video

Scan: Reference

Video: BOP ring gasket / flange seal — search (YouTube)

Reference: IADC — International Association of Drilling Contractors

5. Rings and O-Rings

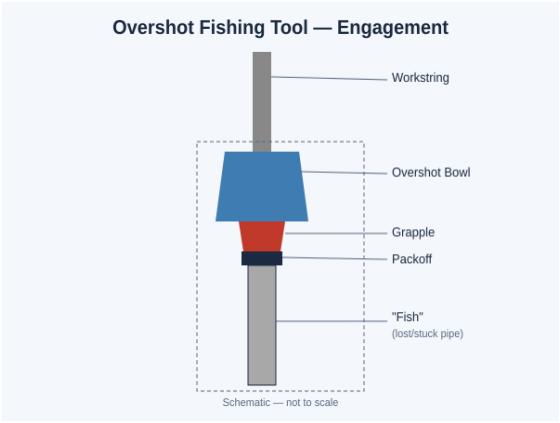
Ring gaskets (metal, API ring-type joint) and elastomeric O-rings provide the primary seal at flanged and threaded connections respectively, throughout the wellhead and BOP assembly.

5.1 BOP Test Plug

The BOP test plug is landed in a profile within the wellhead, isolating the wellbore below from the BOP stack above. With the plug in place, the BOP stack — including its rams and annular preventer — can be pressure-tested from above using surface pumps, without exposing the live wellbore to the test pressure. This allows BOP function and pressure-integrity testing to be carried out safely and routinely, as required by well-control regulations and best practice.

5.2 Restored Tool — Photograph & Schematic

BOP test plug, restored — Production Engineering Laboratory, DUIET



Test plug isolating wellbore during BOP test

5.3 Video & Reference — Scan to Access

Scan: Video

Scan: Reference

Video: BOP test plug pressure test — search (YouTube)

Reference: IADC — International Association of Drilling Contractors

6. Winch Line and Wireline

Winch line and wireline are spooled steel cables with distinct but related rig-floor and well-intervention roles.

6.1 Winch Line

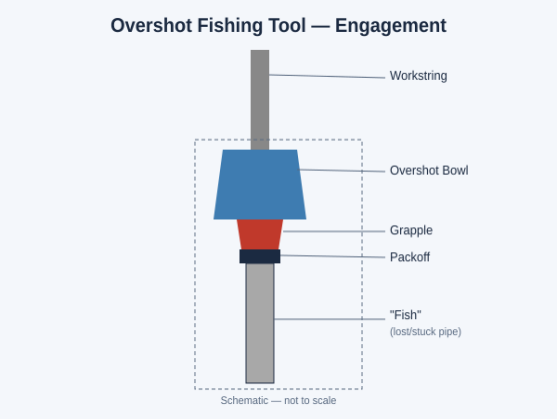
Winch line is used for general rig-floor hoisting and pulling tasks — moving equipment, tensioning, and other mechanical assistance around the rig site.

6.2 Wireline

Wireline is a precision-conveyance cable used to run and retrieve logging tools, plugs, gauge cutters, and small mechanical tools into and out of the wellbore under carefully controlled tension, often with depth-correlated measurement built into the surface equipment.

6.3 Restored Tools — Photograph & Schematic

Wire and cable items, restored — Production Engineering Laboratory, DUIET



Wireline conveyance concept

6.4 Video & Reference — Scan to Access

Scan: Video

Scan: Reference

[Video: Wireline / winch line oilfield — search (YouTube)]

[Reference: IADC — International Association of Drilling Contractors]

7. Summary Table

Tool	Primary Function	Conveyed By
Overshot	Engages and retrieves lost/stuck fish	Workstring
Gauge Cutter	Verifies clear, known-ID path before tools run	Slickline / wireline
BOP/Flange Gaskets	Seal flanged connections under pressure	Installed at flange make-up
O-Rings	Secondary elastomeric seal	Installed in grooves at assembly
BOP Test Plug	Isolates wellbore for BOP pressure testing	Run/landed in wellhead profile
Winch Line	General rig-floor hoisting/pulling	Rig winch
Wireline	Precision conveyance for downhole tools	Wireline unit

This concludes Section 6, and the final document, of the Production Engineering Laboratory tool reference series.